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ILLINOIS DEPARTMENT OF
PUBLIC HEALTH
A Healthier Today For A Better Tomorrow

Bernard J. Turnock, M.D., Director

#905169001

May 17, 1990

Robert Gusman
3534A Connecticut
St. Louis, MO 63118

Dear Mr. Gusman:

Pursuant to your request, staff within the Environmental Toxicology Program of this Department have evaluated the incident at Cerro Copper in which you were reportedly injured and the information generated as a result. This effort was directed toward determining if any persistent health effects would likely be anticipated as a result of that exposure. We further submitted the available information to our medical and toxicologic consultants at Cook County Hospital's Division of Occupational and Environmental Medicine and at the University of Illinois in Urbana with a request for their opinion.

We are hampered somewhat in our evaluation by a lack of knowledge of specifics in this case. We assume, therefore, that the information relayed in the reports is substantially correct, and that the compounds to which you were exposed are qualitatively and quantitatively similar to those detected in subsequent soil sampling (a summary of the soil sample results is enclosed for your information). While the data provided us by IEPA does furnish enough information to form some preliminary conclusions about the exposure and the types and amounts of chemicals involved, detailed information is lacking as to the actual incident, duration of exposure, reported symptoms, treatment received, persistent problems, or other particulars of the case. In this regard, should further evaluation be necessary or desired, you may wish to write down your recollections of the details of the incident, including observations, odors, or sensations experienced, length of exposure, symptoms experienced, personal protective equipment used, and other pertinent information. The more details we have the better able we are to assess the effects of this incident. Such information, together with your medical records (also lacking at this point), would be considered vital to a complete understanding of this situation and an assessment of your complaints and potential problems.

To summarize the incident as recorded, during the late afternoon of September 20, 1989 while drilling a post hole on the landfill in the rear of Cerro Copper's property (also known as Site I), the drill hit a buried object, possibly a drum, at about the eight foot depth. You were at the hole and were the closest individual to the area. The reports indicate that vapors were released from the hole after removal of the auger to the extent that you quickly experienced adverse symptoms (dizziness and chest tightness). There is an indication that you may have contacted the waste directly by trying to free a metal fragment (drum lid?) from the auger. Since at the Cerro Clinic you were also instructed to wash your hands, we assume you may not have been wearing gloves at the time of the incident. One may also assume since you apparently complied with the request to wash your hands, the exposure was insufficient to render you unconscious or prevent a response to a request for coordinated behavior. You were subsequently transported from Cerro's Medical Department to Alexian Brothers Hospital in St. Louis. You were held for observation and released on September 22, 1989. Other members of your drilling crew also went to the hospital, but were not admitted. Symptoms or complaints experienced by the other individuals were not reported.

The identification of the chemical constituents of the waste would indicate the source of the chemicals as Monsanto. Several of the compounds identified were manufactured at the Krummich Plant. Of particular note are the high concentrations of polychlorinated biphenyls (PCBs), chlorinated benzenes, and chlorinated anilines. Additionally, certain herbicides (2,4-D and 2,4,5-TP) and their precursors (di- and trichlorophenols) were detected. Since these compounds were components of or related to components of Agent Orange (also manufactured at the Krummich Plant), the possibility exists that this material also contained chlorinated dioxins and furans as contaminants.

It is important for you to recognize that the presence of a compound or compounds in the soil samples does not necessarily mean you were exposed to that compound or compounds. Your position relative to the drum, the distance, and the physicochemical properties of the chemicals would dictate the predominant exposure pattern. The most likely exposure scenario would have the drill bit penetrate the barrel and release the contents as well as any pressure that might have accumulated. The loosened dirt atop the auger and the auger itself would have effectively prevented any escape of materials until the auger was removed from the hole. At that point those compounds of sufficient volatility would escape from the hole as vapor. Those compounds classified as volatile organic solvents would be the most likely to have been released from the post hole in sufficient amounts to cause the reported symptoms. The primary

compounds detected in the volatile fraction were trichloroethylene, tetrachloroethylene, dichloroethylene, chlorobenzene, benzene, toluene, ethylbenzene, and xylene. Additional compounds from the semi-volatile class (chlorinated benzenes, chlorinated phenols, and chlorinated anilines) may also have escaped, albeit at lower levels than the volatiles. It is unlikely that the heavier components, including PCBs and (if present) dioxins and furans, would have escaped as vapor in appreciable amounts, if at all.

The symptoms described are characteristic of acute solvent overexposure and can be associated with the compounds in the volatile and semi-volatile fraction. Exposures to such compounds typically results in disturbances to the central nervous system. The effects of high-level exposure are quite similar with all organic solvents. Symptoms include disorientation, giddiness, euphoria, loss of coordination, headache, dizziness, slow reaction time, sleepiness, and facial numbness. Irritation of the eyes, nose, and throat can also occur. If exposure to very high levels continues, more serious symptoms including unconsciousness, paralysis, convulsions, and death from respiratory or cardiac arrest can result. In most cases, the recovery from the central nervous system effects is quite rapid and complete following removal from exposure.

Based on this information and your experience, it is our conclusion that pulmonary exposure to the solvent vapors emanating from the post hole could result in respiratory irritation and central nervous system disturbance of the type reported. Additional exposure may have occurred through direct contact of the material by the hands. However, it is unclear if this actually occurred, whether gloves were employed, or whether waste materials were present on the metal fragment. Assuming the worst case (ungloved hands contacting a liquid material and remaining unwashed for a period of time) would not in our view increase the overall exposure markedly, although the compounds encountered in this way may differ qualitatively and quantitatively from those released to air. The lungs, however, represent a larger surface area and possess a more efficient absorptive capacity than the hands, and so contribute the largest portion of the total absorbed dose. Because the compounds to which you were most likely exposed are eliminated very quickly from the body, there are unfortunately no biomedical analyses that can be performed to determine the extent of your exposure at this date. One of our consultants did suggest that a serum PCB level be established to determine if it was higher than expected; however, the majority do not feel that your exposure was sufficient to increase your body burden of PCBs measurably and that such a test would be of little value.

This incident represents a one-time relatively short exposure to compounds in common use and for which there is sufficient toxicologic information to base an opinion. The reported symptoms are consistent with acute exposure to organic solvents; however, these effects would be expected to dissipate very quickly following cessation of exposure without lingering effects. It appears unlikely, therefore, that any persistent health complaints you may be experiencing can be logically associated with the incident last fall based on the information in our hands. We would be happy to consult further with your physician regarding this matter, and to make a referral to specialists in occupational medicine if your physician feels it warranted. We would also be happy to consider any additional information or details regarding your experience that you feel might have bearing on your case. The type of information needed is detailed in the front of this letter. Medical Release forms are also enclosed. Should you desire further evaluation on our part we request you fill out one for each physician or clinic you have utilized as the result of this incident and return the completed forms to us. All medical records are kept confidential.

I trust this information helps clarify the situation somewhat. If we can provide further information or answer additional questions, please feel free to contact us. Thank you for your patience and interest in this matter.

Sincerely,

Thomas F. Long
Senior Toxicologist
Environmental Toxicology Program

cc: Division of Environmental Health, Region 4, Edwardsville
Ken Mensing, IEPA-LPC, Collinsville
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Central Office File

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